

1 a first laser diode operating with an output beam
2 having a first wavelength,

3 a second laser diode operating with an output beam
4 having a second wavelength different from said first wavelength,

5 optical means for either directing the output beam of
6 said first laser diode at a said compact disk when carried by
7 said disk support and drive means or directing the output beam of
8 said second laser diode at a said digital versatile disk when
9 carried by said disk support and drive means, [and]

10 a single element objective lens optically positioned
11 between said disk support and drive means on one end and said
12 first and second laser diodes on another end,

13 said single element objective lens having a central
14 aperture zone and an outer aperture zone, said central aperture
15 zone being profiled to operate at a first numerical aperture (NA)
16 and said output beam of said first laser diode being optically
17 confined to said central aperture zone, [and]

18 said outer aperture zone together with said central
19 aperture zone being profiled to operate at a second numerical
20 aperture (NA) and wherein said output beam of said second laser
21 diode has ray fans extending across the full aperture of said
22 lens, and

23 diffraction means carried by said single element
24 objective lens, said diffraction means providing sufficient
25 aspheric surface power for spherical aberration correction and
26 providing correction for spherochromatism.

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2 2. (amended) The apparatus of claim 1 wherein said lens
3 has first and second surfaces, and said first surface is located
4 closer to said disk support and drive means than said second
5 surface and [further comprising] said diffractive means is
6 carried by said second surface[, said diffractive means providing
7 sufficient aspheric surface power for spherical aberration cor-
8 rection and providing correction for spherochromatism].
9

A1 10 3. (amended) The apparatus of claim 1 wherein said lens
11 has first and second surfaces, and said first surface is located
12 closer to said disk support and drive means than said second
13 surface and [further comprising] said diffractive means is
14 carried by said first surface[, said diffractive means providing
15 sufficient aspheric surface power for spherical aberration cor-
16 rection and providing correction for spherochromatism].
17

18 4. (amended) The apparatus of claim [2] 1 wherein said
19 diffractive means provides sufficient correction for spherical
20 aberration and for spherochromatism that said single element
21 objective lens achieves diffraction-limited image quality for
22 both CD and DVD formats.

23
24 5. (amended) An optical disk reader or optical read/write
25 system capable of operating in either a compact disk (CD) or
26 digital versatile disk (DVD) format, comprising:

1 disk support and drive means capable of supporting and
2 driving either a compact disk having a [cover plate] disk
3 substrate of thickness 2X or a digital versatile disk having a
4 [cover plate] disk substrate of thickness X,

5 a first laser diode operating with an output beam
6 wavelength of approximately 780 nm,

7 a second laser diode operating with an output beam
8 wavelength of approximately 650 nm,

9 optical means for either directing the output beam of
10 said first laser diode at a said compact disk when carried by
11 said disk support and drive means or directing the output beam of
12 said second laser diode at a said digital versatile disk when
13 carried by said disk support and drive means, [and]

14 a single element objective lens optically positioned
15 between said disk support and drive means on one end and said
16 first and second laser diodes on another end, said single element
17 objective lens having first and second surfaces, said first
18 surface having an aspheric profile,

19 said single element objective lens having a central
20 aperture zone and an outer aperture zone, said central aperture
21 zone being profiled to operate at approximately a 0.45 numerical
22 aperture (NA) and said output beam of said first laser diode
23 being optically confined to said central aperture zone, [and]

24 said outer aperture zone together with said central
25 aperture zone being profiled to operate at approximately a 0.60
26 numerical aperture (NA) and wherein said output beam of said